Alqalam Journal of Medical and Applied Sciences. 2026;9(2):391-396
https://doi.org/10.54361/ajmas.269212

Original article

Medication Adherence and Perceptions of Pharmaceutical Care among Patients with Chronic Diseases in Tripoli, Libya

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Abstract
Medication adherence is crucial for effective chronic disease management, yet non-adherence remains a significant global challenge. Pharmaceutical care, including patient education and counseling, is a pivotal strategy to enhance adherence. This study aimed to assess medication adherence patterns and patient perceptions of pharmaceutical care among patients with chronic diseases in Tripoli, Libya. A descriptive, cross-sectional study was conducted between October and December 2025 in Tripoli, Libya. A convenience sample of 200 adult patients diagnosed with one or more chronic diseases for a minimum of six months was recruited. Data were collected using a structured, pretested questionnaire covering demographic and clinical characteristics, medication adherence behaviors, and patient perceptions regarding the pharmacist's role. The study population exhibited a high prevalence of comorbidities, with 50% of participants having diabetes and 40% having hypertension. Adherence assessment revealed that 40% of patients reported sometimes or often forget to take their medication. A critical finding was the high rate of intentional non-adherence, with 70% of participants reporting they stop their medication if they experience side effects. Regarding pharmaceutical care, a significant majority of patients (85%) believed that the pharmacist's counseling helps them adhere to their treatment, and 80% expressed a desire to receive more information or counseling from their pharmacist. While patients in Tripoli highly value the role of the pharmacist, the high rate of non-adherence linked to side effects represents a major, addressable barrier to optimal care. The findings underscore the urgent need for health authorities and pharmacists to implement standardized, proactive follow-up protocols focused on monitoring and managing adverse drug reactions. Leveraging the strong patient demand for counseling will be essential to fully integrate pharmacists into the chronic disease management team and significantly improve adherence rates in the region.
Keywords. Medication Adherence, Pharmaceutical Care, Chronic Diseases, Pharmacist.

Introduction

Medication adherence is a key determinant of therapeutic efficacy in chronic disease care. Adherence can prevent the progression of disease, decrease hospitalizations, and lower health care costs [1]. Pharmaceutical care, including patient education, medication consultation, and provision of therapeutic monitoring, is now recognized as an important approach to improve adherence rates among patients with chronic diseases like diabetes, hypertension, asthma, and cardiovascular diseases [2,3]. The role of pharmacists extends beyond dispensing medications; they are integral in providing personalized care that addresses the multifaceted barriers to adherence. Pharmacist-led interventions, including medication therapy management (MTM), have demonstrated efficacy in improving patient outcomes by ensuring optimal medication use and fostering patient engagement [4, 5].

These interventions are especially useful in places where patients deal with issues such as polypharmacy, complex regimens, and limited access to healthcare [6]. Demographic characteristics greatly affect adherence to medications. There could be some theoretical or impractical causes that affect patient adherence, including age and gender, the educational status of a patient, etc., which we have considered in our study and found out that variables like age, gender, educational background, and duration of disease impact a degree of patients' adherence to prescribed medications [7, 8]. For example, older adults often have cognitive or functional limitations that may impact medication adherence, and people with higher levels of education generally have greater health literacy, which enables better self-management [9, 10].

In Libya, it is important to know such dynamics because the health care system has special challenges, such as limited resources and uneven distribution and accessibility of health services in different regions [11,12]. In Libya, very recent studies have demonstrated the importance of pharmaceutical care in enhancing adherence to medication among chronic disease patients [13]. It is well documented that patient education, counselling, and follow-up interventions, which are conducted by the pharmacist, improve adherence rates considerably and create better clinical results [14]. These findings underscore the importance of tailoring pharmaceutical care strategies to local healthcare settings, particularly in regions where resources and patient awareness may vary. Furthermore, a related study in Libya highlighted the prevalence and patterns of drug-drug interactions (DDIs) and medicine use among hospitalized patients in Libya. The research highlighted the significance of DDIs in compromising treatment effectiveness and patient safety. It emphasizes the need for vigilant monitoring and management of DDIs, advocating for the role of

Received*: 05-12-2025 -* ***Accepted****: 03-02-2026 -* ***Published****: 10-02-2026*

pharmacists in identifying and mitigating potential interactions to ensure optimal therapeutic outcomes [15]. This study aims to assess medication adherence patterns and explore patient perceptions of pharmaceutical care among patients with chronic diseases attending healthcare facilities in Tripoli, Libya.

Methods

Study Design and Setting

This cross-sectional, descriptive study was carried out from October to December 2025. A validated questionnaire was employed in this investigation. The purpose of the study was to evaluate how patients with chronic illnesses in Tripoli, Libya, perceived pharmaceutical care and medication adherence. To guarantee a wide representation of the patient population, data were gathered from a variety of public and private healthcare facilities as well as community pharmacies throughout the city.

Study Population

Adult patients 18 years of age and older who had been diagnosed with one or more chronic illnesses, such as diabetes mellitus, hypertension, cardiovascular diseases, and asthma, made up the study population. Receiving ongoing pharmaceutical treatment for chronic disease for at least six months before data collection was a crucial inclusion criterion.

Inclusion Criteria

Participants were eligible for inclusion if they were adult patients aged 18 years or older with a diagnosed chronic illness and had been taking medication continuously for at least six months. Eligible participants were required to be capable of providing reliable responses and communicating effectively. In addition, only those who gave verbal informed consent to participate in the study were included.

Exclusion Criteria

Patients were excluded from the study if they had transient medical conditions or acute illnesses that did not require long-term therapy. Individuals with mental illnesses, cognitive impairments, or communication difficulties that could compromise the accuracy of the data were also excluded. Patients who declined to participate, withdrew their consent at any stage, or provided inconsistent or incomplete questionnaire responses were not included in the analysis.

Sample Size and Sampling Technique

A convenience sampling method was used to recruit participants from community pharmacies and outpatient clinics during the study period. A target sample size of 200 participants was established to ensure adequate representation across disease categories and demographic groups. This sample size was considered sufficient to provide reasonable precision for descriptive analyses and adequate statistical power to detect moderate differences between groups at a 5% significance level. Participants who provided informed consent were enrolled until the target sample size was achieved.

Data Collection

A standardized, pretested questionnaire was used to gather data after pertinent literature was reviewed, and validated instruments on medication adherence and pharmaceutical care were modified. The questionnaire was divided into three sections: demographic and clinical characteristics (age, gender, educational level, type and duration of chronic disease); medication adherence behaviour (questions about forgetfulness, intentional discontinuation, side effects, and timing consistency); and pharmacist's role and patient perception (questions about counselling, follow-up, satisfaction, and perceived impact of pharmaceutical care on adherence). Under supervision, qualified pharmacists and pharmacy students performed in-person interviews to administer the questionnaire. To guarantee that the answers were clear and comprehensive, each interview lasted roughly ten to fifteen minutes.

Ethical Considerations

Ethical approval for the study was obtained from the Research Ethics Committee of the University of Tripoli Alahlia (Department of Pharmacy). All participants were informed about the objectives of the study and assured of the confidentiality and anonymity of their data.

Data Management and Statistical Analysis

After being coded and placed into a Microsoft Excel spreadsheet, the questionnaire data were sent to the Statistical Package for the Social Sciences (SPSS) version 26.0 for statistical analysis. The analysis began with a complete overview of the data using descriptive statistics. All categorical variables, such as demographics (e.g., age groups, gender, and education level), clinical data (e.g., type and duration of chronic disease), medication adherence categories, and patient perceptions of the pharmacist's role, had their frequencies and percentages computed.

Received*: 05-12-2025 -* ***Accepted****: 03-02-2026 -* ***Published****: 10-02-2026*

https://doi.org/10.54361/ajmas.269212

Results

Demographic and Clinical Characteristics

A total of 200 patients with chronic diseases participated in this cross-sectional study. The demographic and clinical characteristics of the study population are summarized in (Table 1). The sample showed a slight female predominance (55% female, 45% male). The age distribution indicated that most participants were middle-aged or older, with 40% in the 36–55 years range and another 40% in the over 55 years age group. Regarding educational attainment, the highest proportion of participants had a university degree (35%), followed by secondary education (30%), primary education (25%), and postgraduate qualifications (10%).
The most prevalent chronic diseases reported were diabetes (50%), hypertension (40%), and heart disease (25%). The sum of these percentages exceeds 100%, indicating a high prevalence of comorbidities within the study population. The duration of the chronic disease was between 1 and 5 years for half of the participants (50%), while 35% had been living with their condition for more than 5 years.

Table 1. Demographic data

Characters	N (%)
Age	
18-35 years	40(20%)
36-55 years	80(40%)
>55 years	80(40%)
Gender	
Female	110 (55%)
Male	90(45%)
Level of education	
Primary	50(25%)
Secondary	60(30%)
University	70(35%)
Postgraduate	20(10%)
Types of chronic diseases	
Diabetes	100(50%)
Hypertension	80(40%)
Heart disease	50(25%)
Asthma	15(7.5%)
Others	5(2.5%)
Duration of diseases	
< 1 year	30(15%)
1-5 years	100(50%)
>5 years	70(35%)

Medication Adherence Patterns

(Table 2), the evaluation of medication adherence identified a number of significant trends. Twenty percent of patients were taking four or more drugs each day, while the majority (50%) were taking two to three. For many patients, forgetfulness was a contributing reason to non-adherence; 30% said they "sometimes" forget to take their medication, and 10% said they "often" forget. On the other hand, 60% of the patients said they "rarely" or "never" forget. Seventy percent of the subjects reported quitting their medicine if they encountered side effects, which is a crucial result regarding purposeful non-adherence. Additionally, 20% of patients acknowledged quitting their medicine when they felt better, suggesting a possible lack of patient education on the ongoing nature of managing chronic illnesses. Lastly, 65% of the patients said they took their medication at the same time every day, indicating that two-thirds of the sample had a respectable degree of routine consistency.

Table 2. Medication adherence

Variable	N (%)
How many medications do you take daily?	
1	60(30%)
2–3	100(50%)
4 or more	40(20%)
How often do you forget to take your medicine?	
Never	50(25%)
Rarely	70(35%)
Sometimes	60(30%)
Often	20(10%)

Received*: 05-12-2025 -* ***Accepted****: 03-02-2026 -* ***Published****: 10-02-2026*

Do you stop taking your medicine when you feel better?	
Yes	40(20%)
No	160(80%)
Do you stop your medicine if you experience side effects?	
Yes	140(70%)
No	60(30%)
Do you take your medication at the same time every day?	
Yes	130(65%)
No	70(35%)

Patients' Perception of the Pharmacist's Role

According to (Table 3), patients' opinions of the pharmacist's participation in their care were generally favourable. Seventy-five percent of patients said their pharmacists had given them instructions on how to take their medications. However, there was less consistency in the frequency of side effect follow-up: 40% stated their pharmacist "always" enquired about side effects, 35% answered "sometimes," and 25% said "never." Overall satisfaction with the pharmacist's advice was high, with 45% of patients reporting being *very satisfied* and 40% reporting being *satisfied*. Importantly, 85% of respondents believed that the pharmacist's counseling helped them adhere to their treatment plan. Additionally, 80% of participants expressed a desire to receive more information or counseling from their pharmacist, reflecting a positive perception of the pharmacist's role and a need for additional support.

Table 3 Patients' Perceptions of the Pharmacists' Role

Variables	N (%)
Has your pharmacist explained how to take your medicines correctly?	
Yes	150(75%)
No	50(25%)
Does your pharmacist ask about side effects or problems with your medicines?	
Always	80(40%)
Sometimes	70(35%)
Never	50(25%)
How satisfied are you with the pharmacist's advice?	
Very satisfied	90(45%)
Satisfied	80(40%)
Not satisfied	30(15%)
Do you think the pharmacist's counseling helps you adhere to your treatment?	
Yes	170(85%)
No	30(15%)
Would you like to receive more information or counseling from your pharmacist?	
Yes	160(80%)
No	40(20%)

Discussion

The goal of the current study was to evaluate patients with chronic illnesses in Tripoli, Libya, regarding their perspectives on pharmaceutical care and medication adherence. The results show a complicated interaction between patient behaviour, difficulties in managing diseases, and the perceived worth and provision of pharmaceutical services.

The high frequency of deliberate non-adherence, especially the 70% of patients who said they stopped taking their prescription because of side effects, is a crucial result of this study. This number indicates a substantial obstacle to the appropriate management of chronic illness in this population and is much higher than rates reported in some foreign publications. The high percentage indicates a significant need for improved patient-pharmacist communication, even though adverse drug reactions are a widely acknowledged obstacle to adherence [16]. When compared to the 25% of patients who stated that their pharmacist "never" enquires about side effects or issues with their medications, this figure is very alarming (Table 3). The high prevalence of self-discontinuation could be reduced by this follow-up gap, which represents a lost chance for early

Received*: 05-12-2025 -* ***Accepted****: 03-02-2026 -* ***Published****: 10-02-2026*

intervention, side-effect treatment, and patient assurance. Additionally, the fact that 20% of patients discontinue their medicine when they "feel better" highlights a basic ignorance of the chronic nature of their conditions. Health literacy and patient education on long-term therapy are frequently mentioned as areas for improvement in studies conducted in the Middle East, which frequently report this pattern of non-adherence [17].

The study firmly confirms the beneficial effects and high perceived value of pharmaceutical care despite the difficulties with adherence. Eighty percent of patients said they would like more information or counselling, and a sizable majority (85%) said the pharmacist's counselling helped them stick to their therapy. This result is consistent with an increasing amount of evidence, including systematic reviews from the Middle East, showing that pharmacist-led interventions, like medication reconciliation, counselling, and patient education, are successful in improving clinical and humanistic outcomes for patients with chronic illnesses [18]. The large percentage of patients who are satisfied or very satisfied with the pharmacist's recommendations (85%) indicates that patients value and accept the care they receive. This establishes a solid basis for the development of more organised and thorough pharmaceutical care services.

The demographic profile of the study population, with a high prevalence of comorbidities (e.g., 50% with diabetes and 40% with hypertension), is typical of chronic disease cohorts in the region. Our findings on the importance of pharmacist counseling are consistent with a recent comparative study in Tripoli, Libya, which also highlighted the necessity of targeted interventions, including patient education and follow-up, to optimize therapeutic outcomes [13]. That study identified socio-demographic factors such as older age and longer duration of medication use as positive predictors of adherence, suggesting that our population, which is predominantly middle-aged and older (80% over 35 years) and has a long disease duration (85% over 1 year), is a prime target for intensive pharmaceutical care.

The current study's focus on the specific barrier of side-effect-related non-adherence provides a more granular insight into the challenges faced by Libyan patients than broader regional reviews. It suggests that while the availability of counseling is appreciated (75% received an explanation), the quality and consistency of follow-up, particularly concerning adverse effects, must be systematically improved to translate positive perceptions into better adherence rates. The results underscore the need for a standardized protocol for follow-up care in community and hospital pharmacy settings in Tripoli. Given that 70% of non-adherence is linked to side effects, pharmacists should be mandated to proactively screen for and manage adverse drug reactions at every patient encounter. The strong patient demand for more counseling (80%) provides a clear mandate for health authorities to integrate pharmacists more fully into the chronic disease management team, moving beyond simple dispensing to comprehensive medication therapy management (MTM).

Conclusion

This study provides valuable insights into medication adherence patterns and the perception of pharmaceutical care among patients with chronic diseases in Tripoli, Libya. The findings confirm that while patients highly value the role of the pharmacist, significant barriers to optimal adherence persist. This highlights a major gap in the current model of care, specifically in the consistent and proactive follow-up regarding adverse drug reactions. Conversely, the study reveals a strong willingness among patients to engage with pharmaceutical care, as evidenced by the 85% who believe counseling helps adherence and the 80% who desire more information [13]. In conclusion, to significantly improve medication adherence and therapeutic outcomes in Libya, there is an urgent need to transition from a reactive to a proactive model of pharmaceutical care. Health authorities and pharmacy leadership must implement standardized protocols for follow-up care, ensuring that pharmacists systematically monitor for and manage side effects. By leveraging the high patient satisfaction and demand for counseling, these targeted interventions can transform the pharmacist's role into a central pillar of chronic disease management, ultimately reducing non-adherence and improving public health in the region.

Acknowledgments

The authors would like to express their sincere gratitude to all individuals and institutions who contributed to the successful completion of this study. First and foremost, we extend our deepest appreciation to the patients who generously volunteered their time and shared their experiences, without whom this research would not have been possible. We are grateful to the Research Ethics Committee of the University of Tripoli Alahlia (Department of Pharmacy) for providing the necessary ethical approval and guidance for this study. Special thanks are due to the healthcare facilities and community pharmacies in Tripoli that facilitated data collection, as well as the trained pharmacists and pharmacy students who diligently conducted the face-to-face interviews. Finally, we acknowledge the support and resources provided by our respective institutions throughout the duration of this research.

Conflict of interest. Nil

Received: *05-12-2025* - ***Accepted***: *03-02-2026* - ***Published***: *10-02-2026*

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Received*: 05-12-2025 -* ***Accepted****: 03-02-2026 -* ***Published****: 10-02-2026*